What is claimed:

1. A MIMO channel emulator comprising a channel emulator mixing matrix, the channel emulator mixing matrix receiving N inputs and generating M outputs, the channel emulator mixing matrix comprising:

5   a plurality of splitters, each splitter receiving at least one of the N inputs, each splitter generating a plurality of signal paths;

        at least one phase shifter, each phase shifter adjustably shifting a phase of at least one signal path; and

        a plurality of combiners, each combiner receiving more than one of the plurality

10   of signal paths, at least one combiner receiving a phase adjusted signal path, each combiner generating at least one of the M outputs.

2. The MIMO channel emulator of claim 1, wherein the at least one phase shifter is set to emulate an angle of departure of at least one of the signal paths.

15 3. The MIMO channel emulator of claim 1, wherein the at least one phase shifter is set to emulate an angle of arrival of at least one of the signal paths.

4. The MIMO channel emulator of claim 1, wherein the at least one phase shifter is manually controlled.

5. The MIMO channel emulator of claim 1, wherein the at least one phase shifter is

20   electronically controlled.

6. The MIMO channel emulator of claim 1, further comprising:

    a plurality of fading emulators, each fading emulator receiving at least one

emulator input, the plurality of emulators generating the N splitter inputs.

7. The MIMO channel emulator of claim 6, wherein the fading emulators comprise

5   fading delay lines.

8. The MIMO channel emulator of claim 6, further comprising:

    a plurality of second splitters, each second splitter receiving at least one channel

input signal, each second splitter generating a plurality of second signal paths;

    at least one second phase shifter, each second phase shifter adjustably shifting a

10 phase of at least one second signal path; and

    a plurality of second combiners, each second combiner receiving more than one

of the plurality of second signal paths, at least one second combiner receiving a phase

adjusted second signal path, each second combiner generating at least one of the fading

emulator inputs.

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9. The MIMO channel emulator of claim 6, wherein the fading emulators are adjusted so

    that each of the M outputs are not fully correlated with each of the other M outputs.

10. The MIMO channel emulator of claim 1, further comprising:

20   a co-channel interference mixing matrix, the co-channel mixing matrix generating

a plurality of interference outputs, wherein

    at least one of the combiners receives at least one of the interference outputs.

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11. The MIMO channel emulator of claim 10, wherein the co-channel interference mixing matrix comprises:

a plurality of interference splitters, each interference splitter receiving at least one of a plurality of interference inputs, each interference splitter generating a plurality of

5   multi-path representative interference signals;

at least one interference phase shifter, each interference phase shifter adjustably shifting a phase of at least one multi-path representative interference signal; and

a plurality of interference combiners, each interference combiner receiving more than one of the plurality of multi-path representative interference signals, at least one

10   interference combiner receiving a phase adjusted multi-path representative interference signal, each interference combiner generating at least one of the interference outputs.

12. The MIMO channel emulator of claim 1, further comprising:

a noise generator, the noise generator generating at least one noise output;

15   wherein

at least one of the combiners receives at least one noise output.

13. A MIMO channel emulator comprising a channel emulator mixing matrix, the

20   channel emulator mixing matrix receiving N inputs and generating M outputs, the channel emulator mixing matrix comprising:

a plurality of splitters, each splitter receiving at least one of the N inputs, each splitter generating a plurality of signal paths;

at least one attenuator, each attenuater adjustably attenuating an amplitude of at least one signal path; and

a plurality of combiners, each combiner receiving more than one of the plurality of signal paths, at least one combiner receiving an amplitude adjusted signal path, each combiner generating at least one of the M outputs.

14. The MIMO channel emulator of claim 13, further comprising:

a plurality of fading emulators, each fading emulator receiving at least one emulator input, the plurality of emulators generating the N splitter inputs.

15. The MIMO channel emulator of claim 14, further comprising:

a plurality of second splitters, each second splitter receiving at least one channel input signal, each second splitter generating a plurality of second signal paths;

at least one second attenuator, each second attenuator adjustably attenuating an amplitude of at least one second signal path; and

a plurality of second combiners, each second combiner receiving more than one of the plurality of second signal paths, at least one second combiner receiving a phase adjusted second signal path, each second combiner generating at least one of the fading emulator inputs.

16. A method of emulating a transmission channel receiving N inputs and generating M outputs, the method comprising:

splitting at least one of the N inputs, each split input generating a plurality of

signal paths;

adjustably phase shifting a phase of at least one signal path; and

combining the plurality of signal paths generating the M outputs, at least one

5   combination including a phase adjusted signal path.

17. The method of emulating a transmission channel of claim 16, wherein adjustably

phase shifting a phase of at least one signal path emulates an angle of departure of at

least one of the signal paths.

10   18. The MIMO channel emulator of claim 16, wherein adjustably phase shifting a phase

of at least one signal path is adjusted to emulate a correlation between the multi-

representative signals.

19. The MIMO channel emulator of claim 16, wherein adjustably phase shifting a phase

of at least one signal path is manually controlled.

15   20. The MIMO channel emulator of claim 16, wherein adjustably phase shifting a phase

of at least one signal path is electronically controlled.

21. A MIMO channel emulator comprising a channel emulator mixing matrix, the

channel emulator mixing matrix receiving N inputs and generating M outputs, the

channel emulator mixing matrix comprising:

20   a plurality of splitters, each splitter receiving at least one of the N inputs, each

splitter generating a plurality of signal paths;

at least one phase shifter, each phase shifter adjustably shifting a phase of at least one signal path;

a plurality of combiners, each combiner receiving more than one of the plurality of signal paths, at least one combiner receiving a phase adjusted signal path, each

5   combiner generating at least one of the M outputs.

a plurality of fading emulators, each fading emulator receiving at least one emulator input, the plurality of emulators generating the N splitter inputs;

a plurality of second splitters, each second splitter receiving at least one channel input signal, each second splitter generating a plurality of second signal paths;

10   at least one second phase shifter, each second phase shifter adjustably shifting a phase of at least one second signal path; and

a plurality of second combiners, each second combiner receiving more than one of the plurality of second signal paths, at least one second combiner receiving a phase adjusted second signal path, each second combiner generating at least one of the fading

15   emulator inputs.